

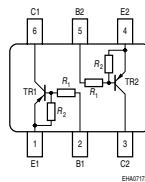
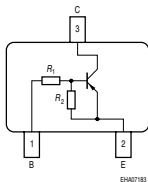
## PNP Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 10k\Omega$ ,  $R_2 = 10k\Omega$ )
- For 6-PIN packages: two (galvanic) internal isolated transistors with good matching in one package



**BCR183/F/L3**  
**BCR183T/W**

**BCR183S/U**  
**SEMB11**



| Type     | Marking | Pin Configuration |      |      |      |      |      | Package  |
|----------|---------|-------------------|------|------|------|------|------|----------|
| BCR183   | WMs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23    |
| BCR183F  | WMs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3   |
| BCR183L3 | WM      | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSLP-3-4 |
| BCR183S  | WMs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363   |
| BCR183T  | WMs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SC75     |
| BCR183U  | WMs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SC74     |
| BCR183W  | WMs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT323   |
| SEMB11   | WM      | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT666   |

**Maximum Ratings**

| Parameter                                                                                                                                                                                                                                                                                                                                                      | Symbol      | Value                                                | Unit             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------|------------------|
| Collector-emitter voltage                                                                                                                                                                                                                                                                                                                                      | $V_{CEO}$   | 50                                                   | V                |
| Collector-base voltage                                                                                                                                                                                                                                                                                                                                         | $V_{CBO}$   | 50                                                   |                  |
| Emitter-base voltage                                                                                                                                                                                                                                                                                                                                           | $V_{EBO}$   | 10                                                   |                  |
| Input on voltage                                                                                                                                                                                                                                                                                                                                               | $V_{i(on)}$ | 20                                                   |                  |
| Collector current                                                                                                                                                                                                                                                                                                                                              | $I_C$       | 100                                                  | mA               |
| Total power dissipation-<br>BCR183, $T_S \leq 102^\circ\text{C}$<br>BCR183F, $T_S \leq 128^\circ\text{C}$<br>BCR183L3, $T_S \leq 135^\circ\text{C}$<br>BCR183S, $T_S \leq 115^\circ\text{C}$<br>BCR183T, $T_S \leq 109^\circ\text{C}$<br>BCR183U, $T_S \leq 118^\circ\text{C}$<br>BCR183W, $T_S \leq 124^\circ\text{C}$<br>SEMB11, $T_S \leq 75^\circ\text{C}$ | $P_{tot}$   | 200<br>250<br>250<br>250<br>250<br>250<br>250<br>250 | mW               |
| Junction temperature                                                                                                                                                                                                                                                                                                                                           | $T_j$       | 150                                                  | $^\circ\text{C}$ |
| Storage temperature                                                                                                                                                                                                                                                                                                                                            | $T_{stg}$   | -65 ... 150                                          |                  |

**Thermal Resistance**

| Parameter                                | Symbol     | Value      | Unit |
|------------------------------------------|------------|------------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |            | K/W  |
| BCR183                                   |            | $\leq 240$ |      |
| BCR183F                                  |            | $\leq 90$  |      |
| BCR183L3                                 |            | $\leq 60$  |      |
| BCR183S                                  |            | $\leq 140$ |      |
| BCR183T                                  |            | $\leq 165$ |      |
| BCR183U                                  |            | $\leq 133$ |      |
| BCR183W                                  |            | $\leq 105$ |      |
| SEMB11                                   |            | $\leq 300$ |      |

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

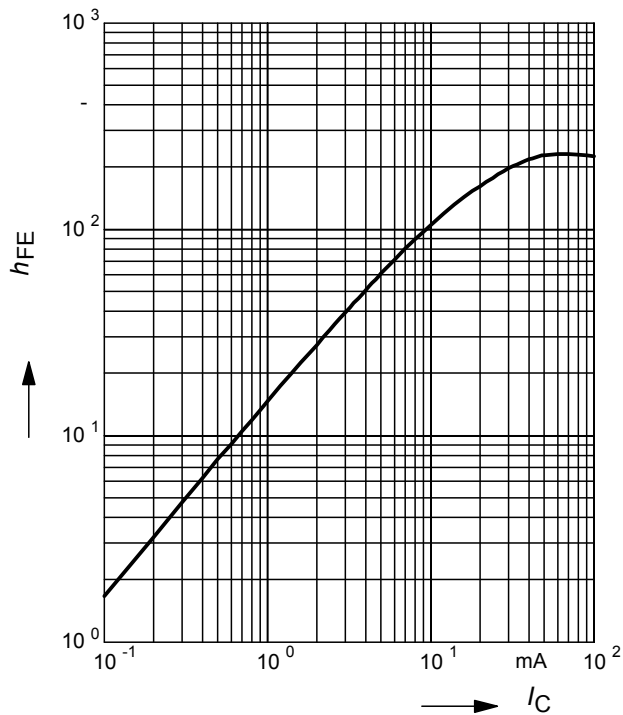
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                             | Symbol                      | Values |      |      | Unit |
|-------------------------------------------------------------------------------------------------------|-----------------------------|--------|------|------|------|
|                                                                                                       |                             | min.   | typ. | max. |      |
| DC Characteristics                                                                                    |                             |        |      |      |      |
| Collector-emitter breakdown voltage<br>$I_C = 100\ \mu\text{A}$ , $I_B = 0$                           | $V_{(\text{BR})\text{CEO}}$ | 50     | -    | -    | V    |
| Collector-base breakdown voltage<br>$I_C = 10\ \mu\text{A}$ , $I_E = 0$                               | $V_{(\text{BR})\text{CBO}}$ | 50     | -    | -    |      |
| Collector-base cutoff current<br>$V_{\text{CB}} = 40\ \text{V}$ , $I_E = 0$                           | $I_{\text{CBO}}$            | -      | -    | 100  | nA   |
| Emitter-base cutoff current<br>$V_{\text{EB}} = 10\ \text{V}$ , $I_C = 0$                             | $I_{\text{EBO}}$            | -      | -    | 0,75 | mA   |
| DC current gain <sup>1)</sup><br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                 | $h_{\text{FE}}$             | 30     | -    | -    | -    |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\ \text{mA}$ , $I_B = 0,5\ \text{mA}$  | $V_{\text{CEsat}}$          | -      | -    | 0,3  | V    |
| Input off voltage<br>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 0,8    | -    | 1,8  |      |
| Input on voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0,3\ \text{V}$                            | $V_{\text{i(on)}}$          | 1      | -    | 2,5  |      |
| Input resistor                                                                                        | $R_1$                       | 7      | 10   | 13   | kΩ   |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0,9    | 1    | 1,1  | -    |
| AC Characteristics                                                                                    |                             |        |      |      |      |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 200  | -    | MHz  |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\ \text{V}$ , $f = 1\ \text{MHz}$                    | $C_{\text{cb}}$             | -      | 3    | -    | pF   |

<sup>1)</sup>Pulse test:  $t < 300\ \mu\text{s}$ ;  $D < 2\%$

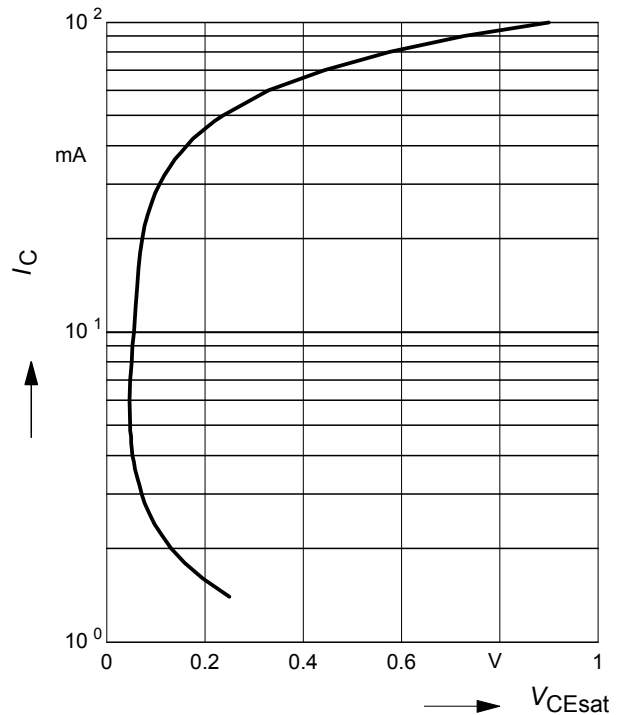
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 5 \text{ V}$  (common emitter configuration)



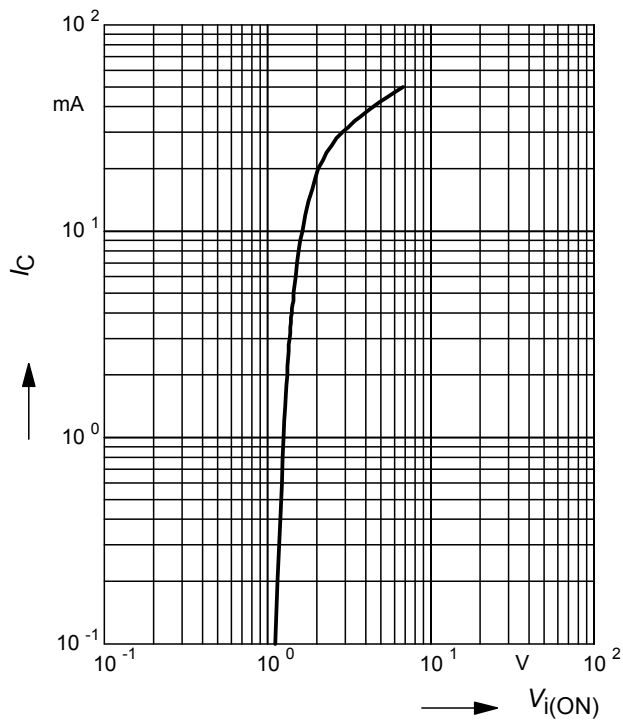
**Collector-emitter saturation voltage**

$V_{CEsat} = f(I_C)$ ,  $h_{FE} = 20$



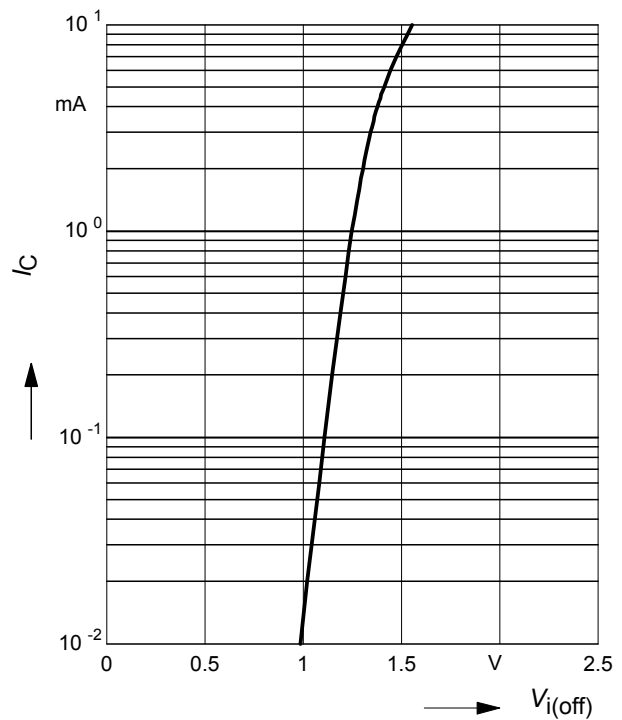
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3 \text{ V}$  (common emitter configuration)



**Input off voltage  $V_{i(off)} = f(I_C)$**

$V_{CE} = 5 \text{ V}$  (common emitter configuration)



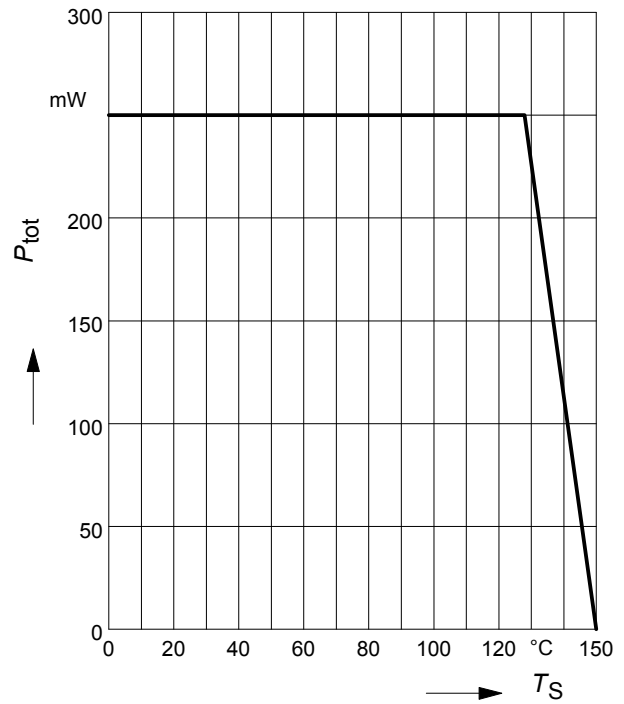
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR183**



**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR183F**



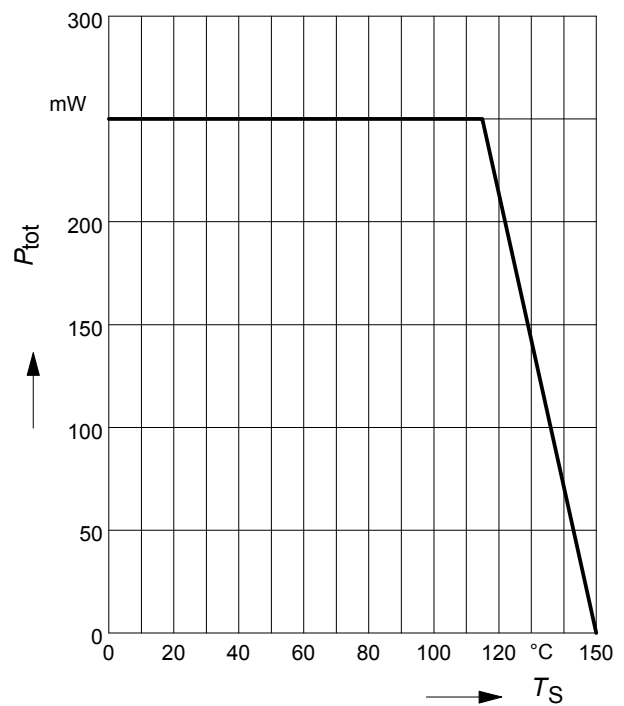
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR183L3**



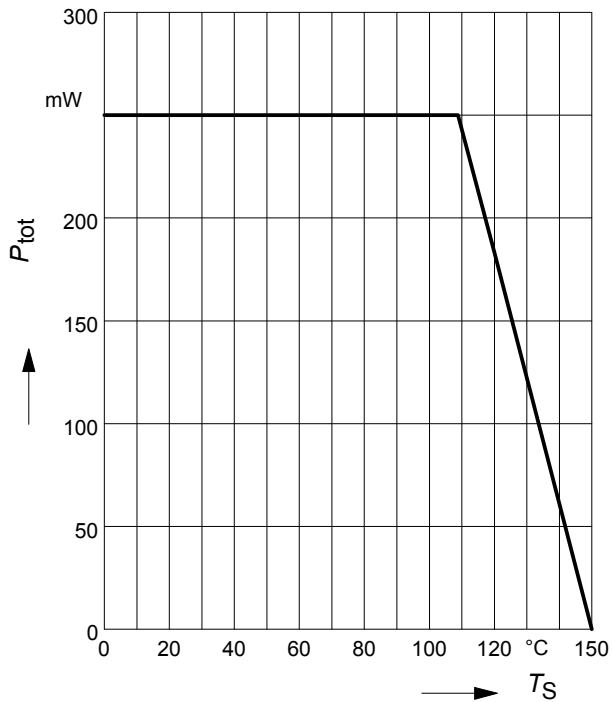
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR183S**



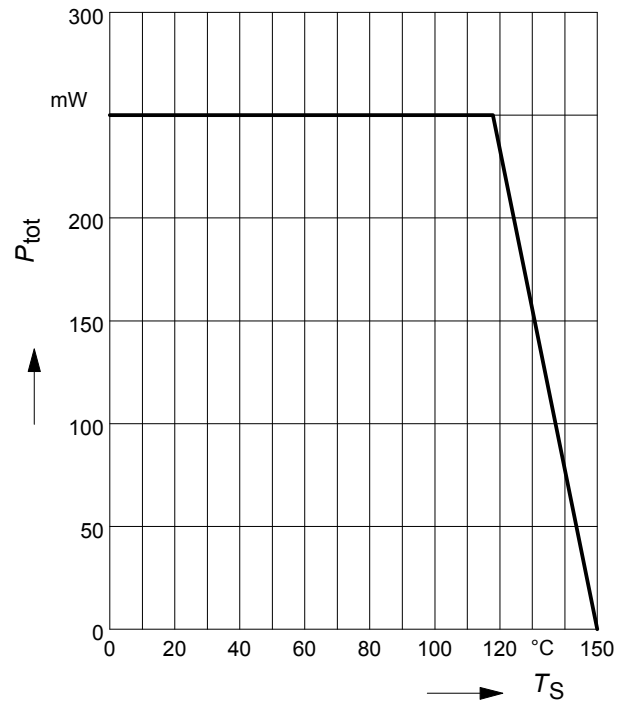
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR183T



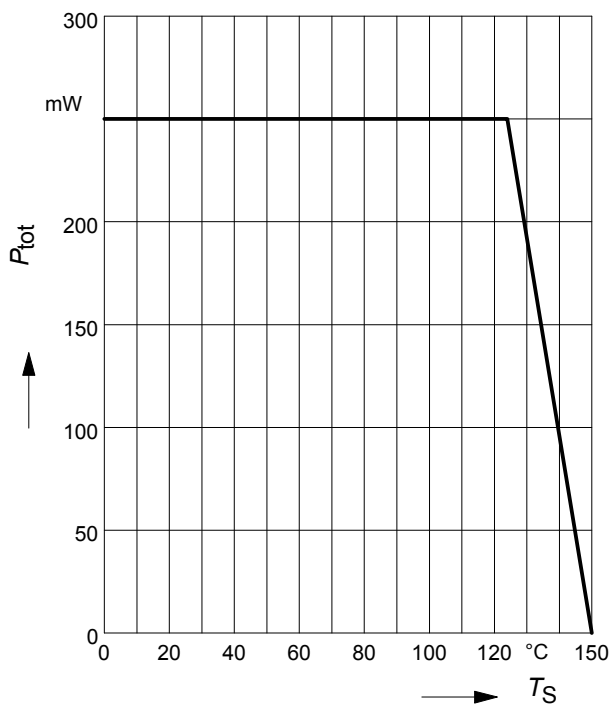
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR183U



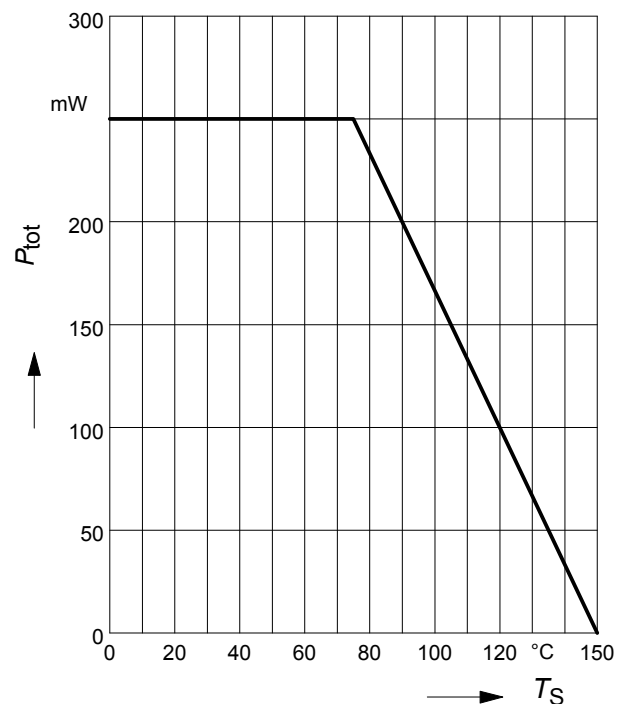
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR183W



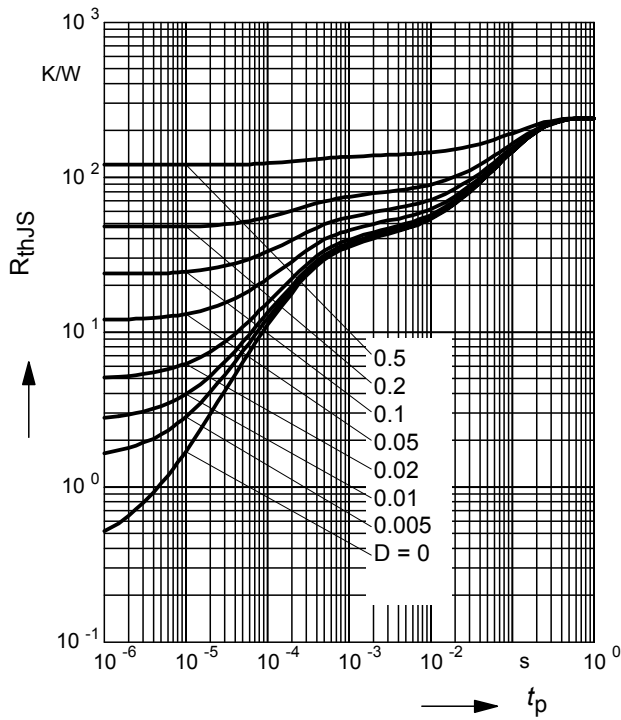
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

SEMB11



**Permissible Pulse Load  $R_{thJS} = f(t_p)$**

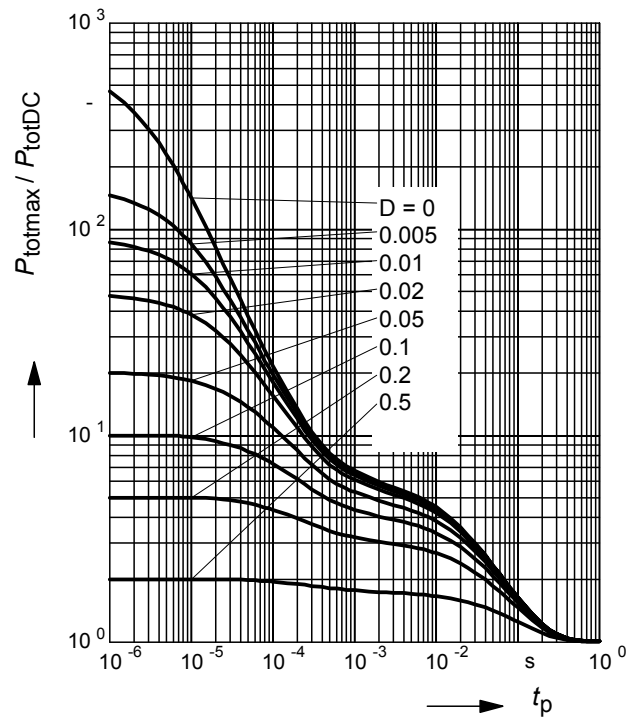
BCR183



**Permissible Pulse Load**

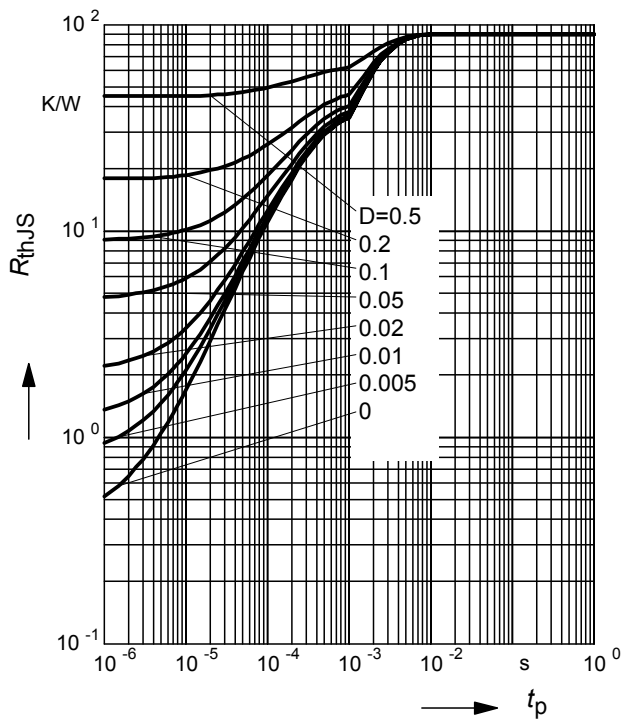
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

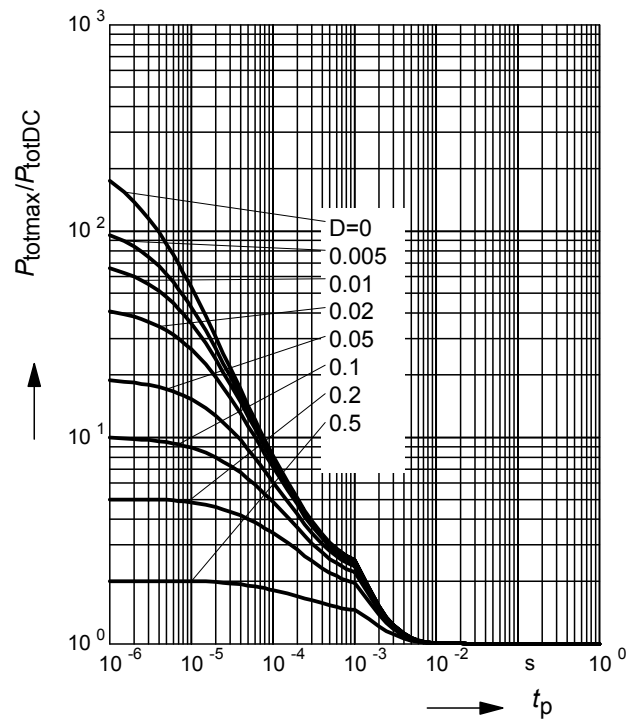
BCR183F



**Permissible Pulse Load**

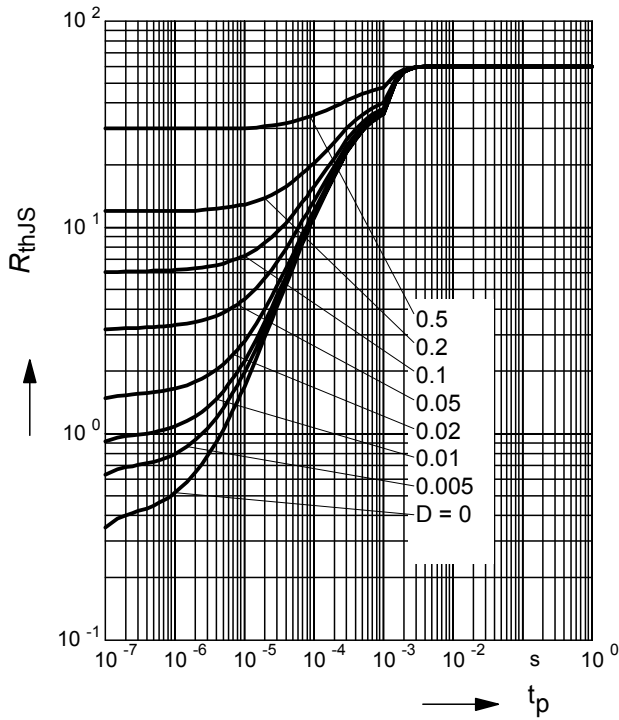
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183F



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

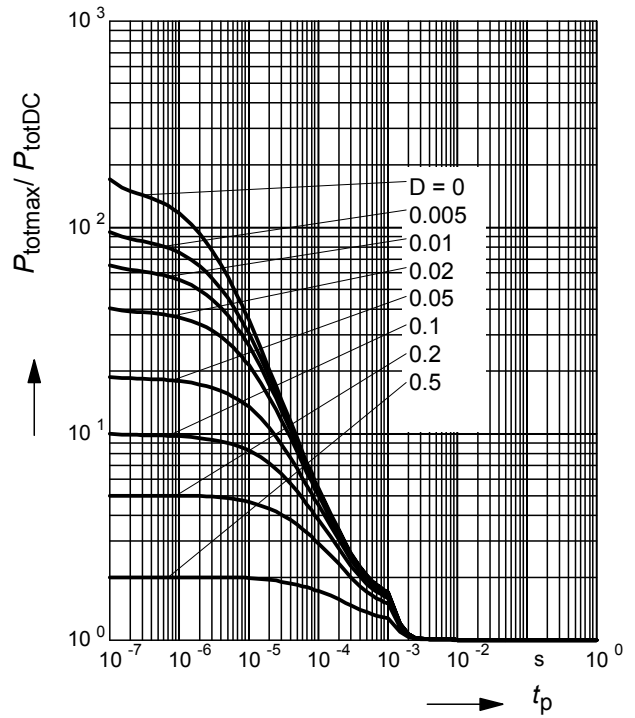
BCR183L3



**Permissible Pulse Load**

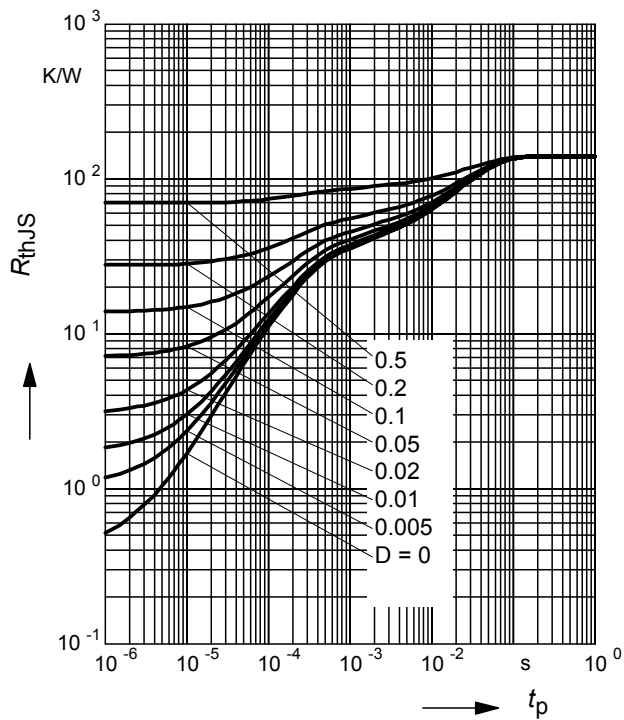
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183L3



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

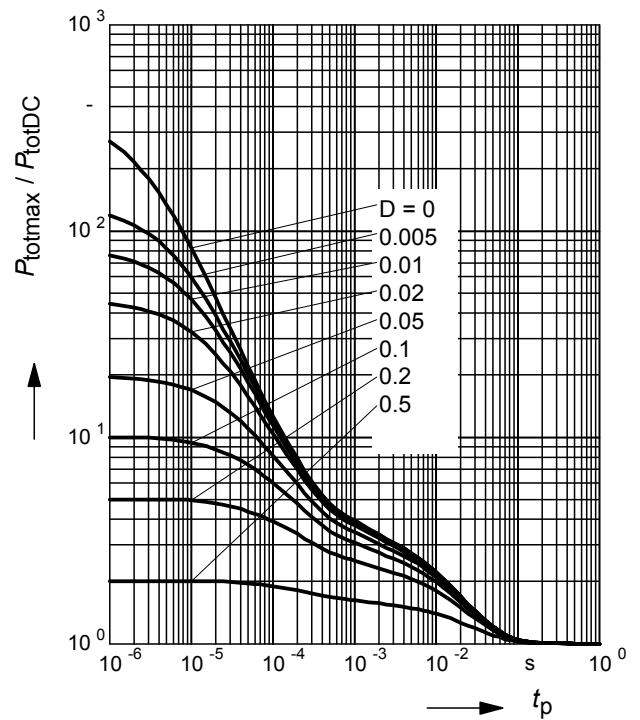
BCR183S



**Permissible Pulse Load**

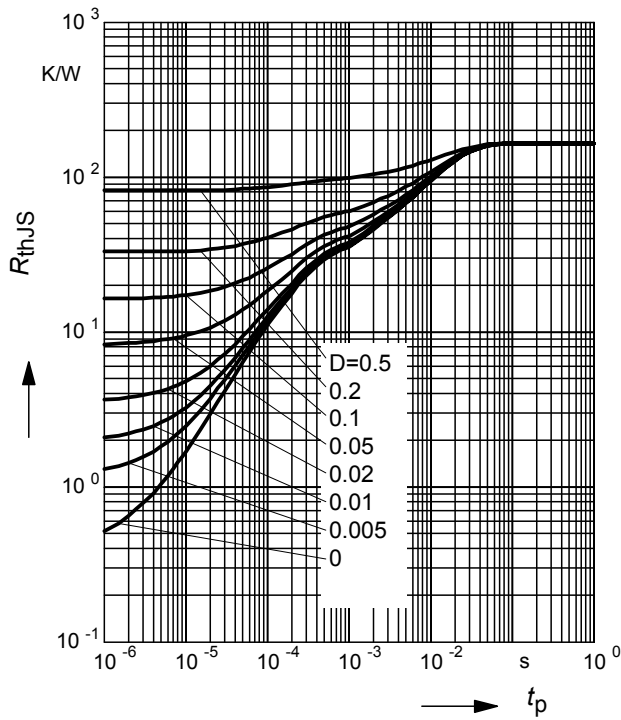
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183S



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

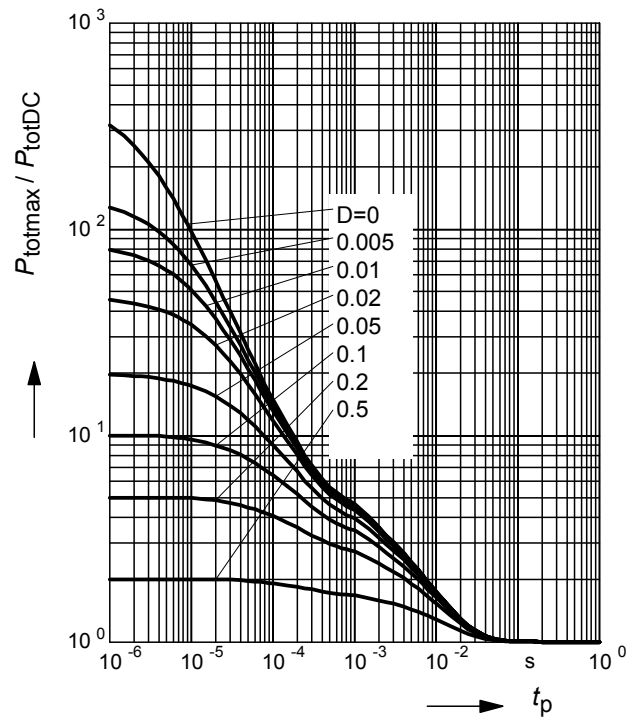
BCR183T



**Permissible Pulse Load**

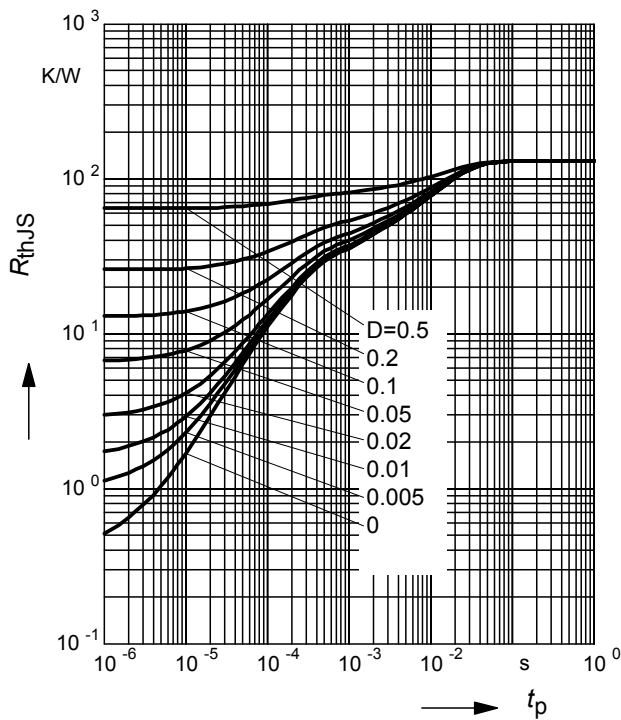
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183T



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

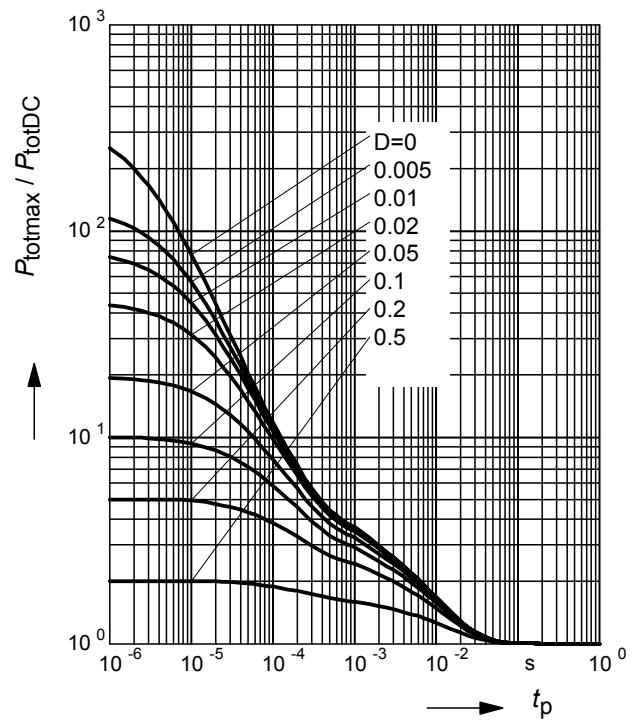
BCR183U



**Permissible Pulse Load**

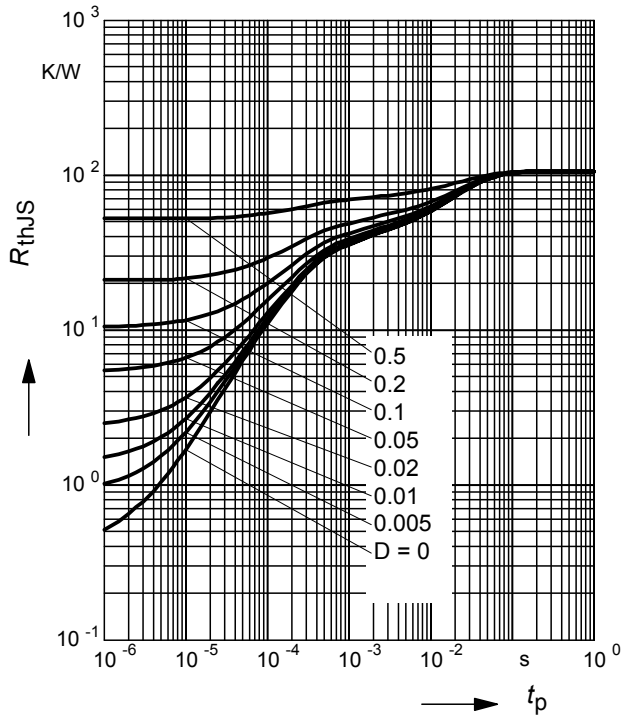
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR185U



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

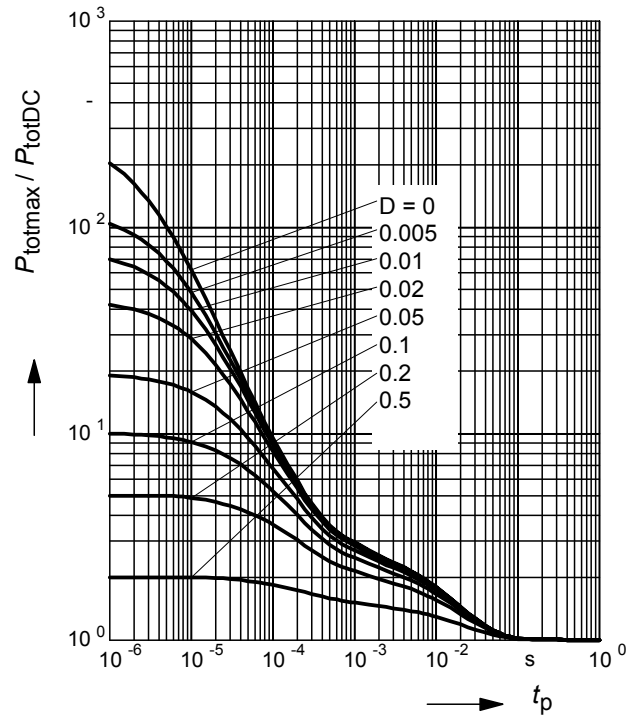
BCR183W



**Permissible Pulse Load**

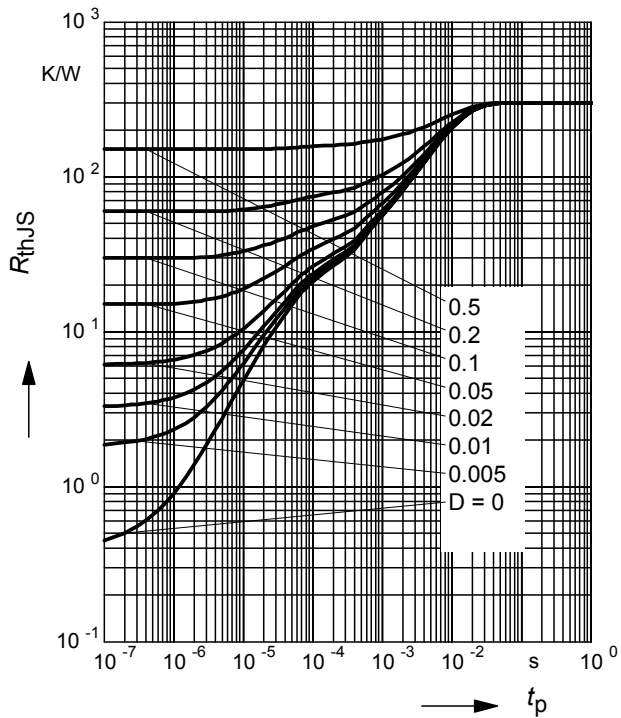
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR183W



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

SEMB11



**Permissible Pulse Load**

$$P_{totmax}/P_{totDC} = f(t_p)$$

SEMB11

